

Serial No.: 10/769,777
Docket No.: 101-1015
Amendment After Final dated August 31, 2009
Reply to the Final Office Action of July 2, 2009

REMARKS

Introduction

Upon entry of the foregoing amendment, claims 1, 3, 4, 6-10, 13, 16-19, 22, 25-30, 32, 34-36, 39, 42-45, 48, 51-55 and 57 are pending in the application. Claims 1, 16, and 51 have been amended. Claims 2, 5, 11, 12, 14, 15, 20, 21, 23, 24, 31, 33, 37, 38, 40, 41, 46, 47, 49, 50, and 56 have been previously canceled without prejudice or disclaimer. No new matter is being presented. In view of the following remarks, reconsideration and allowance of all the pending claims are requested.

Entry of this Amendment After Final is proper under 37 C.F.R. §1.116 because the claim amendments: (a) place this application in condition for allowance (for the reasons discussed herein), (b) do not raise any new issues requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution as indicated in the Final Office Action), (c) present the rejected claims in better form for consideration on appeal (should an appeal be necessary), and (d) are necessary and were not earlier presented because they are made in response to arguments raised in the Final Office Action.

Accordingly, for at least the reasons discussed above, entry of this Amendment is respectfully requested.

Rejection under 35 USC § 101

Claims 1, 3, 4, 6-10, 13, 16-19, 22, 51 and 57 have been rejected under 35 U.S.C. §101 as not falling within one of the four statutory categories of invention. In view of the following remarks, reconsideration of these claims and withdrawal of these rejections are earnestly solicited.

With regard to independent claim 1, this claim presently recites, among other things, a method of "splitting an image block" with an "image block splitting apparatus," including "setting a plurality of splitting threshold values" with a "macro block splitting determining unit" of the "image block splitting apparatus" and "setting a plurality of other splitting threshold values" with

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a “sub block splitting determining unit” of the “image block splitting apparatus.” As the method of claim 1 presently recites, among other things, an “image block splitting apparatus,” that includes a “macro block splitting determining unit” and a “sub block splitting determining unit,” Applicants respectfully submit that claim 1 is at least “tied to another statutory category (such as a particular apparatus)” and therefore falls into at least “one of the four statutory categories of invention.” With regard to claims 3, 4, 6-10, and 13, Applicants submit that as these claims depend from independent claim 1, and therefore contain all of the features of claim 1, claims 3, 4, 6-10 and 13 are also at least “tied to another statutory category (such as a particular apparatus)” and therefore fall into at least “one of the four statutory categories of invention.”

With regard to independent claim 16, this claim presently recites, among other things, a method of “splitting an image block” with an “image block splitting apparatus,” including “setting a plurality of macro block splitting threshold values” and “determining whether to split the macro block” with a “macro block splitting determining unit” of the “image block splitting apparatus” and “setting a plurality of sub block splitting threshold values” and “determining whether to split the sub block into smaller sub blocks” with a “sub block splitting determining unit” of the “image block splitting apparatus.” As the method of claim 16 presently recites, among other things, an “image block splitting apparatus” having a “macro block splitting determining unit” and a “sub block splitting determining unit,” Applicants respectfully submit that claim 16 is at least “tied to another statutory category (such as a particular apparatus)” and therefore falls into at least “one of the four statutory categories of invention.” With regard to claims 17-19 and 22, Applicants submit that as these claims depend from independent claim 16, and therefore contain all of the features of claim 16, claims 17-19 and 22 are also at least “tied to another statutory category (such as a particular apparatus)” and therefore fall into at least “one of the four statutory categories of invention.”

With regard to independent claim 51, this claim presently recites, among other things, a method of “splitting an image block” with an “image block splitting apparatus,” including “splitting macro image blocks each of left-eye views and right eye views into sub image blocks” and “determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split” with a “macro block splitting determining unit” of the “image block splitting apparatus,” and “splitting each sub block into smaller sub blocks” with a “sub

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block splitting determining unit” of the “image block splitting apparatus.” As the method of claim 51 presently recites, among other things, an “image block splitting apparatus” having a “macro block splitting determining unit” and a “sub block splitting determining unit,” Applicants respectfully submit that claim 51 is at least “tied to another statutory category (such as a particular apparatus)” and therefore falls into at least “one of the four statutory categories of invention.” With regard to claim 57, Applicants submit that as this claim depends from independent claim 51, and therefore contain all of the features of claim 51, claim 57 is also at least “tied to another statutory category (such as a particular apparatus)” and therefore fall into at least “one of the four statutory categories of invention.”

For at least the reasons discussed above, reconsideration of these claims and withdrawal of these rejections are earnestly solicited.

Rejection under 35 USC § 103

Claims 1, 3, 10, 13, 16, 19, 22, 25-29, 36, 39, 42, 45, 48, 51, 52, and 57 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Mancini et al. (“Robust Quadtree-based disparity estimation...”, SPIE article) (hereinafter, “Mancini”), U.S. Patent No. 6,529,634 to Thyagarajan et al. (hereinafter, “Thyagarajan”) and U.S. Patent No. 5,923,376 to Pullen et al. (hereinafter, “Pullen”). In view of the following remarks, reconsideration and allowance of these claims are earnestly solicited.

Claim 1

Referring to independent claim 1, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 1. In particular, on page 7 of the Office Action, the Examiner alleges that Pullen discloses:

determining whether to split the block by determining whether a block at a same location in a preceding image frame has been split (“find a block in previous buffer 30, a search corresponds to a block in current frame buffer 16” at col. 12, line 14; “process for level 1 begins by segmenting the level 0 domain in to a

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plurality of level 1 domain child blocks” at col. 18, line 4; “If the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks and each range child block within that range is compared to the domain child block” at col. 18, line 30).

However, it is respectfully submitted that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as presently recited in independent claim 1, for at least the following reasons.

Referring to col. 12, line 14 of Pullen as relied upon by the Examiner, as well as col. 12, lines 15-18, Pullen describes that “[t]o find a block in previous frame buffer 30 which corresponds to a block in current frame buffer 16,” a “search must be performed” by “segmenting the data in current frame buffer 16 into domain blocks having a first size.” That is, Pullen describes performing a “search” to “find a block in the previous frame buffer 30” that “corresponds” with a block in the “current frame buffer 16” by “segmenting the data” in the frame buffer 16 into “domain blocks having a first size” – not “determining” whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split.” Put another way, Pullen describes searching for a “block in previous frame buffer 30” that corresponds to a “block in current frame buffer 16,” by “segmenting the data” in the frame buffer 16, not “determining” whether to “split the macro block into sub blocks” by “determining” whether the “macro block” at a “same location” in a “preceding image frame” has been “split.”

Referring to col. 18, lines 4 and 18 of Pullen as relied upon by the examiner, as well as col. 18, lines 3-6 and 25-34, Pullen describes a “level 1” block search process for the “Y component” begins by “segmenting the level 0 domain block into a plurality of level 1 child domain blocks.” Pullen describes “determining whether a level 1 search is to be performed” by “comparing an estimated level 1 cost for a level 1 block to the distortion measurement for the level 0 block attributable to the level 1 block.” Pullen describes that “[i]f the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks” and “each range child block within that range area is compared to the domain child block.” That is, Pullen describes “segmenting the level 0 domain block into a plurality of level 1 child domain blocks,” and “determining whether a level 1 search

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is to be performed” by “comparing an estimated level 1 cost for a level 1 block” to the “distortion measurement” for the “level 0 block attributable to the level 1 block” -- not “determining” whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split.” Put another way, Pullen describes “segmenting” the domain blocks into child blocks and “determining” whether a “search is to be performed” by “comparing” an estimated cost for a block to the “distortion measurement” for the “level 0 block attributable to the level 1 block” – not “determining” whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split.”

Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, “setting a plurality of splitting threshold values with a macro block splitting determining unit of the image block splitting apparatus to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the macro block into sub blocks with the macro block splitting determining unit by determining whether the macro block at a same location in a preceding image frame has been split” as presently recited in independent claim 1.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants’ claim 1, claim 1 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim are earnestly solicited.

Claims 3, 10, and 13

With regard to claims 3, 10, and 13, it is requested that for at least the reasons that these claims depend from allowable independent claim 1, and therefore contain each of the features as recited in claim 1, claims 3, 10, and 13 are also patentable over Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another.

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Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

Claim 16

Referring to independent claim 16, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 16. In particular, the Examiner alleges on pages 9-10 of the Office Action that Pullen discloses:

determining whether to split the macro block by determining whether a macro block at a same location in a preceding image frame has been split ("find a block in previous buffer 30, a search corresponds to a block in current frame buffer 16" at col. 12, line 14; "process for level 1 begins by segmenting the level 0 domain in to a plurality of level 1 domain child blocks" at col. 18, line 4; "If the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks and each range child block within that range is compared to the domain child block" at col. 18, line 30).

However, it is respectfully submitted that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as presently recited in independent claim 16, for at least the following reasons.

Referring to col. 12, line 14 of Pullen as relied upon by the Examiner, as well as col. 12, lines 15-18, Pullen describes that "[t]o find a block in previous frame buffer 30 which corresponds to a block in current frame buffer 16," a "search must be performed" by "segmenting the data in current frame buffer 16 into domain blocks having a first size." That is, Pullen describes performing a "search" to "find a block in the previous frame buffer 30" that "corresponds" with a block in the "current frame buffer 16" by "segmenting the data" in the frame buffer 16 into "domain blocks having a first size" – not "determining" whether to "split the macro block into sub blocks" with the "macro block splitting determining unit" by "determining whether the macro block at a same location in a preceding image frame has been split" or "determining" whether to "split the sub block into smaller sub blocks" by "determining whether a sub block at a same location in the preceding image frame has been split" with a "sub block splitting determining unit of the image block splitting apparatus." Put another way, Pullen describes

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searching for a “block in previous frame buffer 30” that corresponds to a “block in current frame buffer 16,” by “segmenting the data” in the frame buffer 16, not “determining” whether to “split the macro block into sub blocks” by “determining” whether the “macro block” at a “same location” in a “preceding image frame” has been “split” or “determining” whether to “split the sub block into smaller sub blocks” by “determining whether a sub block at a same location in the preceding image frame has been split.”

Referring to col. 18, lines 4 and 18 of Pullen as relied upon by the examiner, as well as col. 18, lines 3-6 and 25-34, Pullen describes a “level 1” block search process for the “Y component” begins by “segmenting the level 0 domain block into a plurality of level 1 child domain blocks.” Pullen describes “determining whether a level 1 search is to be performed” by “comparing an estimated level 1 cost for a level 1 block to the distortion measurement for the level 0 block attributable to the level 1 block.” Pullen describes that “[i]f the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks” and “each range child block within that range area is compared to the domain child block.” That is, Pullen describes “segmenting the level 0 domain block into a plurality of level 1 child domain blocks,” and “determining whether a level 1 search is to be performed” by “comparing an estimated level 1 cost for a level 1 block” to the “distortion measurement” for the “level 0 block attributable to the level 1 block” -- not “determining” whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split” or “determining” whether to “split the sub block into smaller sub blocks” by “determining whether a sub block at a same location in the preceding image frame has been split” with a “sub block splitting determining unit of the image block splitting apparatus.” Put another way, Pullen describes “segmenting” the domain blocks into child blocks and “determining” whether a “search is to be performed” by “comparing” an estimated cost for a block to the “distortion measurement” for the “level 0 block attributable to the level 1 block” -- not “determining” whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split” or “determining” whether to “split the sub block into smaller sub blocks” by “determining whether a sub block at a same location in the preceding image frame has been split.”

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Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, “setting a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determining whether to split the macro block by determining whether a macro block at a same location in a preceding image frame has been split with a macro block splitting determining unit of the image block splitting apparatus” and “setting a plurality of sub block splitting threshold values for splitting the sub block into smaller sub blocks and determining whether to split the sub block into smaller sub blocks by determining whether a sub block at a same location in the preceding image frame has been split with a sub block splitting determining unit of the image block splitting apparatus” as presently recited in independent claim 16.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants’ claim 16, claim 16 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim are earnestly solicited.

Claims 19 and 22

With regard to claims 19 and 22, it is requested that for at least the reasons that these claims depend from allowable independent claim 16, and therefore contain each of the features as recited in claim 16, claims 19 and 22 are also patentable over Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

Claims 25 and 52

Referring to independent claim 25, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 25. In particular, the Examiner alleges on page 10

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of the Office Action that the “combination discloses a computer-readable medium having computer readable-codes recorded thereon that, when executed by a computer ... perform the method as described by claim 1 above (see claim 1 rejection).” However, it is respectfully submitted that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as presently recited in independent claim 25, for at least the same reasons as discussed above in connection with claim 1.

Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, “setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the macro block into sub blocks by determining whether the macro block at a same location in a preceding image frame has been split” as recited in independent claim 25.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants' claim 25, claim 25 is patentably distinguishable and deemed to be allowable.

With regard to claim 52, it is requested that for at least the reason that this claim depends from allowable independent claim 25, and therefore contains each of the features as recited in claim 25, claim 52 is also patentable over Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

Claim 26

Referring to independent claim 26, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 26. In particular, the Examiner alleges on page 10 of the Office Action that the “combination discloses a computer-readable medium having computer readable-codes recorded thereon that, when executed by a computer ... perform the method as

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described by claim 16 above (see claim 16 rejection).” However, it is respectfully submitted that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as presently recited in independent claim 26, for at least the same reasons as discussed above in connection with claim 16.

Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, “setting a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determining whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split” and “setting a plurality of sub block splitting threshold values for splitting the sub block into smaller sub blocks and determining whether to split the sub block into smaller sub blocks by determining whether the sub block at a same location in the preceding image frame has been split” as recited in independent claim 26.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants’ claim 26, claim 26 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim are earnestly solicited.

Claim 27

Referring to independent claim 27, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 27. In particular, on page 13 of the Office Action, the Examiner alleges that Pullen discloses:

a macro block splitting determining unit (figure 2) that determines therewith whether to split the block by determining whether a block at a same location in a preceding image frame has been split (“find a block in previous buffer 30, a search corresponds to a block in current frame buffer 16” at col. 12, line 14; “process for level 1 begins by segmenting the level 0 domain in to a plurality of level 1 domain child blocks” at col. 18, line 4; “If the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks and each range child block within that

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range is compared to the domain child block” at col. 18, line 30).
However, it is respectfully submitted that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as presently recited in independent claim 27, for at least the following reasons.

Referring to col. 12, line 14 of Pullen as relied upon by the Examiner, as well as col. 12, lines 15-18, Pullen describes that “[t]o find a block in previous frame buffer 30 which corresponds to a block in current frame buffer 16,” a “search must be performed” by “segmenting the data in current frame buffer 16 into domain blocks having a first size.” That is, Pullen describes performing a “search” to “find a block in the previous frame buffer 30” that “corresponds” with a block in the “current frame buffer 16” by “segmenting the data” in the frame buffer 16 into “domain blocks having a first size” – not a “macro block splitting determining unit” that “determines” whether to “split the macro block” by “determining whether the macro block at a same location in a preceding image frame has been split.” Put another way, Pullen describes searching for a “block in previous frame buffer 30” that corresponds to a “block in current frame buffer 16,” by “segmenting the data” in the frame buffer 16, not “determin[ing]” whether to “split the macro block into sub blocks” by “determining” whether the “macro block” at a “same location” in a “preceding image frame” has been “split.”

Referring to col. 18, lines 4 and 18 of Pullen as relied upon by the examiner, as well as col. 18, lines 3-6 and 25-34, Pullen describes a “level 1” block search process for the “Y component” begins by “segmenting the level 0 domain block into a plurality of level 1 child domain blocks.” Pullen describes “determining whether a level 1 search is to be performed” by “comparing an estimated level 1 cost for a level 1 block to the distortion measurement for the level 0 block attributable to the level 1 block.” Pullen describes that “[i]f the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks” and “each range child block within that range area is compared to the domain child block.” That is, Pullen describes “segmenting the level 0 domain block into a plurality of level 1 child domain blocks,” and “determining whether a level 1 search is to be performed” by “comparing an estimated level 1 cost for a level 1 block” to the “distortion measurement” for the “level 0 block attributable to the level 1 block” -- not “determin[ing]”

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whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split.” Put another way, Pullen describes “segmenting” the domain blocks into child blocks and “determining” whether a “search is to be performed” by “comparing” an estimated cost for a block to the “distortion measurement” for the “level 0 block attributable to the level 1 block” – not “determin[ing]” whether to “split the macro block into sub blocks” with the “macro block splitting determining unit” by “determining whether the macro block at a same location in a preceding image frame has been split.”

Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, “a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines therewith whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split” as recited in independent claim 27.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants’ claim 27, claim 27 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim are earnestly solicited.

Claims 28, 29, 36

With regard to claims 28, 29, and 36, it is requested that for at least the reasons that these claims depend from allowable independent claim 27, and therefore contain each of the features as recited in claim 27, claims 28, 29, and 36 are also patentable over Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

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Claim 42

Referring to independent claim 42, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 42. In particular, on pages 15 and 16 of the Office Action, the Examiner alleges that Pullen discloses:

a macro block splitting determining unit (figure 2) that determines therewith whether to split the macro block by determining whether a macro block at a same location in a preceding image frame has been split ("find a block in previous buffer 30, a search corresponds to a block in current frame buffer 16" at col. 12, line 14; "process for level 1 begins by segmenting the level 0 domain in to a plurality of level 1 domain child blocks" at col. 18, line 4; "If the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks and each range child block within that range is compared to the domain child block" at col. 18, line 30).

The Examiner further alleges on page 16 of the Office Action that Pullen discloses:

a sub block splitting determining unit that determine whether to split each sub block by determining whether the sub block at a same location in the preceding image frame has been split ("distortion measurement between the domain child block and the range child block corresponding to the adjusted motion vector is compared to a second error threshold" at col. 5, line 55).

However, Applicants respectfully submit that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features recited in claim 42, for at least the same reasons as discussed above in connection with claims 1 and 27, as well as for the reasons discussed below.

Referring to col. 5, line 55 of Pullen as relied upon by the Examiner, as well as col. 5, lines 56-59, Pullen describes that "[b]efore a domain child block" is "processed for the U and V components," a "distortion measurement" between a "domain child block" and a "range child block corresponding to [an] adjusted motion vector" is "compared to a second error threshold." In other words, Pullen describes "compar[ing]" a "distortion measurement" to a "second error threshold" before processing a "domain child block" – not a "sub block splitting determining unit" that "determines whether to split each sub block" by "determining whether the sub block at a same location in the preceding image frame has been split."

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Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, “a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split” and “a sub block splitting determining unit that sets a plurality of sub block splitting threshold values for splitting each sub block into smaller sub blocks and determines whether to split each sub block by determining whether the sub block at a same location in the preceding image frame has been split” as recited in independent claim 42.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants’ claim 42, claim 42 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim are earnestly solicited.

Claims 45 and 48

With regard to claims 45 and 48, it is requested that for at least the reasons that these claims depend from allowable independent claim 42, and therefore contain each of the features as recited in claim 42, claims 45 and 48 are also patentable over Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

Claims 51 and 57

Referring to independent claim 51, in the Office Action dated July 2, 2009, the Examiner alleges that Mancini, Thyagarajan, and Pullen in combination with one another disclose all of the limitations recited in independent claim 51. In particular, on pages 18 and 19 of the Office Action, the Examiner alleges that Pullen discloses:

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determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split ("find a block in previous buffer 30, a search corresponds to a block in current frame buffer 16" at col. 12, line 14; "process for level 1 begins by segmenting the level 0 domain in to a plurality of level 1 domain child blocks" at col. 18, line 4; "If the estimated cost is less than the distortion measurement, a level 1 range area is defined in the previous frame buffer for one of the domain child blocks and each range child block within that range is compared to the domain child block" at col. 18, line 30; if the estimated cost is more than the distortion measurement, then the level 1 search is not performed hence not splitting the level 0 block).

However, Applicants respectfully submit that Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest each of the features presently recited in claim 51, for at least the same reasons as discussed above in connection with claim 1.

Therefore, Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, do not teach or suggest, among other things, "splitting macro image blocks each of left-eye views and right eye views into sub image blocks according to quadtree disparity estimation using a plurality of splitting threshold values and determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split with a macro block splitting determining unit of the image block splitting apparatus" as presently recited in independent claim 51.

Since Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another, fail to teach or suggest each of the features as recited in Applicants' claim 51, claim 51 is patentably distinguishable and deemed to be allowable.

With regard to claim 57, it is requested that for at least the reason that this claim depends from allowable independent claim 51, and therefore contains each of the features as recited in claim 51, claim 57 is also patentable over Mancini, Thyagarajan, and Pullen, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

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Rejection under 35 USC § 103

Claims 4, 6-9, 17, 18, 30, 32, 34, 35, 43, 44 and 53 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Mancini, Thyagarajan and Pullen as applied to claims 1 and 27 above, and further in view of U.S. Patent No. 5,208,673 to Boyce (hereinafter, "Boyce"). Applicants respectfully traverse these rejections for at least the following reasons.

With regard to claims 4 and 6-9, it is requested that for at least the reasons that these claims depend from allowable independent claim 1, and therefore contain each of the features as recited in claim 1, claims 4 and 6-9 are also patentable over Mancini, Thyagarajan, Pullen, and Boyce, whether taken alone or in combination with one another.

With regard to claims 17 and 18, it is requested that for at least the reasons that these claims depend from allowable independent claim 16, and therefore contain each of the features as recited in claim 16, claims 17 and 18 are also patentable over Mancini, Thyagarajan, Pullen, and Boyce, whether taken alone or in combination with one another.

With regard to claims 30, 32, 34, 35, it is requested that for at least the reasons that these claims depend from allowable independent claim 27, and therefore contain each of the features as recited in claim 27, claims 30, 32, 34, 35, are also patentable over Mancini, Thyagarajan, Pullen, and Boyce, whether taken alone or in combination with one another.

With regard to claims 43, 44, and 53, it is requested that for at least the reasons that these claims depend from allowable independent claim 42, and therefore contain each of the features as recited in claim 42, claims 43, 44, and 53 are also patentable over Mancini, Thyagarajan, Pullen, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims are earnestly solicited.

Rejection under 35 USC § 103

Claims 54 and 55 have been rejected under 35 U.S.C. §103(a) as being unpatentable

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over the combination of Mancini, Thyagarajan, and Pullen as applied to claim 42 above, and further in view of common knowledge in the art. Applicants respectfully traverse these rejections for at least the following reasons.

With regard to claims 54 and 55, it is requested that for at least the reasons that these claims depend from allowable independent claim 42, and therefore contain each of the features as recited in claim 42, claims 54 and 55 are also patentable over Mancini, Thyagarajan, Pullen, and common knowledge in the art, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Examiner's Response to Arguments

In the above Remarks, Applicants address the Examiner's Response to Arguments recited on pages 45-46 of the Office Action, as well as the rejections recited on pages 2-45 of the Office Action. Reconsideration of the pending claims in view of the above Remarks is earnestly solicited.

Conclusion

It is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, there being no other objections or rejections, this application is in condition for allowance, and a notice to this effect is earnestly solicited.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided below.

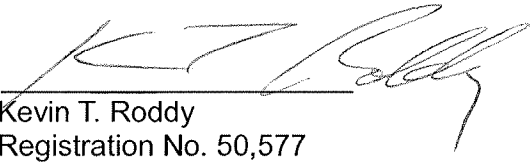
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If any further fees are required in connection with the filing of this amendment, please charge the same to our Deposit Account No. 502827.

Respectfully submitted,

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